UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/769,802	02/03/2004	Sang Yeon Kim	0465-1147P	9250

2292 7590 04/20/2007	EXAMINER
BIRCH STEWART KOLASCH & BIRCH	PATEL, JAYESH A
PO BOX 747	
FALLS CHURCH, VA 22040-0747	

ART UNIT	PAPER NUMBER
2624	

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	04/20/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/20/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

PTOL-90A (Rev. 10/06)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 February 2004*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All   b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date *05/27/05 and 05/17/05*.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 14 is objected to because of the following informalities: The Claim recites

"An image mapping apparatus " It should read "**An image warping apparatus**".

Appropriate correction is required.

Claims 1 and 6 are objected to because of the following informalities: The Claim

recites "driving " It should read "deriving". Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
conditions and requirements of this title.

Claims 1-13 are rejected under 35 U.S.C 101 as the claimed invention is directed

to non-statutory subject matter. Although the claimed invention falls in one of the

four statutory categories (i.e. Method), the Claimed invention is directed to a

Judicial exception of 35 U.S.C 101 (i.e. an abstract idea, natural phenomenon or

laws of nature) and is not directed to a practical application of such judicial

exception because the claims does not achieve any physical transformation and

the invention as claimed does not produce a useful, concrete and tangible result.

In the instant case the Judicial exception is the mathematical algorithms (abstract

idea).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-6 and 14-17 are rejected under 35 U.S.C. 102(e) as being unpatentable

by Jasa et al. (US 20030020732 A1) hereafter Jasa.

1. Regarding Claim 1 Jasa discloses an image warping method in **(Figs 1 and 2)**

comprising: a step (a) of, if coordinates of source and target images are defined

as (u, v) and (x, y), respectively on **(Page 3 Para 0060)**, driving an auxiliary

function by finding a solution of the coordinate y of the target image by leaving

the coordinate v of the source image as constant on **(Page 4 Para 0083)**; a step

(b) of preparing a horizontally warped intermediate image by applying the

auxiliary function to a first backward mapping function u=U(x, y) on **(Page 4 Para**

0071,Page 4 Para 0083 and Page 5 Para 0089); and a step (c) of preparing a

horizontally/vertically warped target image by applying the horizontally warped

intermediate image to a second backward mapping function v=V(x, y) on **(Page 4**

Para 0072 and Page 5 Para 0090). Jasa further discloses this in Fig 4.

2. Regarding Claim 2, Jasa discloses the image warping method of claim 1,

wherein the first backward mapping function $u = U(x, y) = \text{SIGMA } i = 0 \text{ to } N$

$\text{SIGMA } j = 0 \text{ to } N - i \, (a_{ij}) (x)_i (y)_j$, where $a.sub.i$ is a coefficient of a polynomial

and N indicates an order of the polynomial on **(Page 4 Para 0078)**.

3. Regarding Claim 3, Jasa discloses the image warping method of claim 1,

wherein the first backward mapping function $v = V(x, y) = \text{SIGMA } i = 0 \text{ to } N$

$\text{SIGMA } j = 0 \text{ to } N - i \, (b_{ij}) (x)_i (y)_j$, where $b.sub.i$ is a coefficient of a polynomial

and N indicates an order of the polynomial **(Page 4 Para 0078)**.

4. Regarding Claim 4, Jasa discloses the image warping method of claim 1, the

step (b) comprising: a step (d) of finding the coordinate u of the source image by

receiving to apply a value of the coordinate x of the target image on **(Page 5**

Para 0088 and 0089), polynomial coefficient(s) of the first backward mapping

function and the auxiliary function to the first backward mapping function **(Page 6**

Para 0104 and 0105); and a step (e) of preparing the horizontally warped

intermediate image by interpolating data of the coordinate u found in the step (d)

at **(Page 5 Para 0089)**.

5. Regarding Claim 5, Jasa discloses the image warping method of claim 1, the

step (c) comprising: a step (f) of applying the second backward mapping function

to the intermediate image in **(Fig 6 and Page 5 Para 0090)**; a step (g) of finding

the coordinate v of the source image by receiving to apply values of the

coordinates x and y of the target image **(Fig 6 and Page 5 Para 0090)**,

polynomial coefficient(s) of the first backward mapping function **(Page 6 Para**

0104 and 0105), and a result applied in the step (f) to the second backward

mapping function **(Page 6 Para 108 and 109)**; and a step (h) of preparing a

horizontally/vertically warped target image by interpolating data of the coordinate

v found in the step (g) **(Page 5 Para 0090)**.

6. Regarding Claim 6, Jasa discloses an image warping method **(Figs 1 and 2)**

comprising: a step (a) of, if coordinates of source and target images are defined

as (u, v) and (x, y) **(Page 3 Para 0060)**, respectively, driving an auxiliary function

(y=Hv (x)) from a backward mapping function v=V(x, y) by finding a solution of

the coordinate y of the target image by leaving the coordinate v of the source

image as constant **(Page 4 Para 0083)**; a step (b) of preparing a horizontally

warped intermediate image by applying the auxiliary function (y=Hv (x)) to a

backward mapping function u=U(x, y) **(Page 4 Para 0071, Page 4 Para 0083 and**

Page 5 Para 0089); and a step (c) of preparing a horizontally/vertically warped

target image by applying the horizontally warped intermediate image to the

backward mapping function v=V(x, y) **(Page 4 Para 0072 and Page 5 Para**

0090).

7. Claims 14-17 are the corresponding apparatus Claims performed by the

apparatus shown in **(Fig 13 and on Page 7 Para 0114)** by Jasa.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set
forth in section 102 of this title, if the differences between the subject matter sought to be patented and
the prior art are such that the subject matter as a whole would have been obvious at the time the
invention was made to a person having ordinary skill in the art to which said subject matter pertains.
Patentability shall not be negatived by the manner in which the invention was made.

Claims 7-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Jasa in view of Sayre (US 5175808) hereafter Sayre and in further view of well

known prior art.

8. Regarding Claim 7,Jasa discloses image warping method of claim 6.Jasa

however does not discloses the step (a) comprising: a step (d) of, if the backward

mapping functions are $u=U(x,y)=a_{00}+a_{01}y-$

$a_{02}y^2+a_{10}x+a_{11}xy+a_{12}xy^2+a_{20}x^2+a_{21}x^2y$ and $v=V(x,y)=b_{00}+b_{01}y+b_{02}y^2+b_{10}x+b_{11}xy+b_{12}xy^2+b_{20}x^2+b_{21}x^2y$, respectively,

adjusting the backward mapping functions for y by leaving v of $v=V(x, y)$ as

constant to be represented by a quadratic function of $Ay^2+By+C=0$ wherein

$A=b_{02}+b_{12}x$, $B=b_{01}+b_{11}x+b_{21}x^2$, and

$C=b_{00}+b_{10}x+b_{20}x^2-v$; and a step (e) of outputting the

auxiliary function 10 ($y = Hv(x) = -B\frac{\sqrt{B^2-4AC}}{2A}$) by finding a value of y of

the quadratic function from a root formula.

Sayre discloses the image warping method and apparatus and also
discloses that the warping functions (nth order warps) are quadratic and
polynomial functions respectively at **(Col 1 Lines 46-52)**. Also it is well known in
the math world to solve the Quadratic equations or determine roots as well as
solve polynomials. Therefore it would have been obvious for one of ordinary skill
in the art at the time the invention was made, to use the teachings of Sayre to
provide a method and apparatus for the image transformation to implement the
nth order warps and further arbitrary warps **(Col 3 Lines 18-21)** for the above
reasons. Also US Patent # 5475803 shows auxiliary functions being determined
and calculated in (Col 6 Lines 30-50). US patent # 5204944 shows auxiliary
functions being determined and calculated in a different manner at (Col 7 Lines
22-29). Thus from the above it can be seen that the auxiliary function can
determined in many ways, the applicant is required to demonstrate the criticality
of the claimed limitations of quadratic roots and polynomials.

9. Regarding Claim 8, same explanation of claim 7 applies.

10. Regarding Claim 9 see the explanation of Claim 7.

11. Regarding Claim 10 see the explanation of Claim 7.

12. Regarding Claim 11, see the explanation of Claim 7.

13. Regarding Claim 12 see the explanation of Claim7.

14. Regarding Claim 13 see the explanation of Claim 7.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jayesh A. Patel whose telephone number is 571-270-1227. The examiner can normally be reached on M-F 7.00am to 4.30 pm (5-4-9). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service

Representative or access to the automated information system, call 800-786-

9199 (IN USA OR CANADA) or 571-272-1000.

Jayesh Patel
04/13/07
JP

JINGGE WU
SUPERVISORY PATENT EXAMINER